U. S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
ASSISTANT SECRETARY FOR HOUSING-FEDERAL HOUSING COMMISSIONER

TO: DIRECTORS, HOUSING DEVELOPMENT DIVISION

Series and Series Number:

MATERIALS RELEASE
NO. 1265

ISSUE DATE August 24, 1995

REVIEW DATE August 24, 1998

SUBJECT: TIMBERSTRAND™ LAMINATED STRAND LUMBER (LSL)

1. Product

2. Name and Address of Manufacturer

Trus Joist MacMillan
A Limited Partnership
200 E. Mallard Drive
Boise, ID 83706

Data on the nonstandard product described herein have been reviewed by the Department of Housing and Urban Development and determination has been made that it is considered suitable from a technical standpoint for the use indicated herein. This Release does not purport to establish a comparative quality or value rating for this product as compared to standard products normally used in the same manner.

This Materials Release cannot be used as an indication of endorsement, approval or acceptance by HUD of the described product, and any statement or representation, however made, indicating such approval, endorsement or acceptance by HUD is unauthorized. See Code 18, U.S.C. 709.

Any reproduction of this Release must be in its entirety.

Use: General Framing Lumber

Description:

TIMBERSTRAND LSL is manufactured from strands of Aspen (minimum 75%) and the rest White Birch/Red Maple, or strands of Yellow Poplar blended with an isocyanate-based adhesive complying with the requirements of the "TIMBERSTRAND Laminated Strand Lumber Manufacturing Standard/Quality Control Manual." The strands are oriented in a parallel direction and formed into a large mat, 8 feet wide by 35 or 48 feet long, of various thicknesses. The mats are pressed to the desired thicknesses using a steam injection press. TIMBERSTRAND LSL members are available in thicknesses up to 5 1/2 inches, depths to 48 inches and lengths to 35 or 48 feet. TIMBERSTRAND LSL is produced at the Trus Joist MacMillan, Deerwood, Minnesota, and Hazard, Kentucky, manufacturing plants with quality control inspections by PFS Corporation.

Requirements:

TIMBERSTRAND LSL shall meet all requirements of this Materials Release (MR).

1. Manufacturing Tolerance

   A manufacturing tolerance of plus or minus 1/8" shall be allowed for specified length, plus or minus 1/16" for specified width, and plus or minus 1/32" for specified thickness.

2. Resins

   Resins shall be diphenylmethane diisocyanate (MDI). The resin must meet Trus Joist MacMillan TIMBERSTRAND resin qualification standards. The plant shall maintain a list of all approved resin suppliers and the resins for which they are approved.

3. Strand

   The strand specification shall be contained in the Trus Joist Macmillan manufacturing standards.

4. Wax, preservatives and other additives

   The plant shall maintain lists of all approved wax, preservatives and other additives.

Design and Allowable Stresses:

The structural performance of the finished mumber is assured by sampling and testing in accordance with the Trus Joist MacMilland Quality Control Performance Procedures. The design practices for solid sawn lumber apply to TIMBERSTRAND LSL. The design stresses of Table No. 1 are for dry conditions of use where the maximum moisture content of the wood will not exceed 19%.

Fastener capacity shall be in accordance with Table No. 2.

TIMBERSTRAND LSL Rim Board shall be in accordance with the rim joist application noted in Table No. 3.

Table No. 1 TIMBERSTRAND LSL Structural Framining Lumber Design Stresses[1]

Grade MOE (x 104 psi)	Axial (PSI)		Joist/Beam (PSI)			Plank (PSI)		
	F_t[2]	F_c	F_b[3][6]	F_v	F_{c1}	F_b	F_v	F_c[1]
1.3	1075	1400	1700	400	680	1900	150	300
1.5	1580	1950	2250	400	775	2525	150	350
1.7	1925	2500	2825	400	880	3150	150	390
1.9	2150	2850	3075	400	880	3450	150	390
2.1	2500	3275	3500	400	880	3925	150	390

(1) See Figure No. 1 for description of strand orientation.

(2) The F^t values in the table reflect the volume effects of length, width and thickness. Therefore, F^t shall not be used as a limit for design stress when TIMBERSTRAND LSL IS used as a component of engineered products manufactured by Trus Joist MacMillan which are listed in other evaluation reports.

(3) For depths other than 12 inches, regardless of thickness, multiply table values by $(12/d)^{0.092}$.

(4) When structural members quality as repetitive members in accordance with the Minimum Property Standards, a 4 percent increase is permitted for F^b.

Table No. 2- Faster Capacity

Fasteners	Description		Comments
Nail Capacity[1] (lateral & withdrawal	Nail Orientation	Load Direction	For all Grades use SPF Design per applicable code.
	Edge:	Parallel to grain	
	Edge:	Perpendicular to grain	
	Face:	Parallel to grain	
	Face:	Perpendicular to grain	
Bolt capacity - Bolt parallel to WFS			Not evaluated
Bolt capacity - Bolt perpendicular to WFS	Load parallel to grain Load perpendicular to grain		Use 1991 NDS values for red oak
Lag bolt capacity - 1/2 inch diameter - Lag bolt perpendicular to WFS	Load parallel to grain Load perpendicular to grain		400 lbs.[5] 400 lbs.[5]

(1) The closets on center spacing in the parallel to WFS orientation is as follows:

8d common:
3 inch single row
3 inch double row, staggered

10d common:
4 inch single row
4 inch double row, staggered

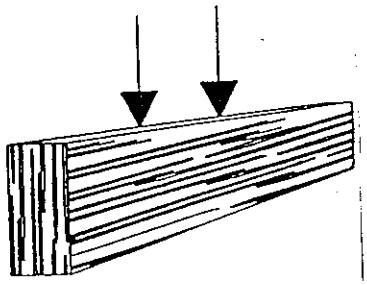
16d common:
12 inch single row
12 inch double row, staggered

The closet on center spacing in the perpending to WFS orientation face is the same as permitted by the Minimum Property Standards for solid sawn lumber.

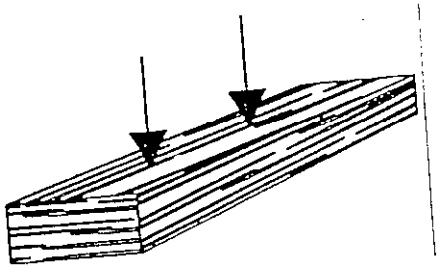
(2) Lateral load permitted for 1/2-inch-diameter lag bolt in 1 1/2-inch thick main and side members with full penetration into the main member. All other lateral loading conditions to be evaluated per 1991 NDS using SG = 0.50. Withdrawal loading conditions have not been evaluated.

TABLE NO. 3 - 1.3 X 10^6E TIMBERSTRAND LSL RIM BOARD

Thickness In.	Allowable Vertical Load - PLF	Maximum Depth - In.
1.25	3450	20
1.50	4140	24
Increase minimum nail spacing 1" for 1.25 thickness		
Decrease 1/2" lag bolt allowable to 325 lbs. for 1.25 thickness		



EDGE LOADING (parallel to wide face of strands (WFS))



FACE LOADING (perpendicular to wide face of strands (WFS))

Figure No. 1 - TIMBERSTRAND LSL Orientation

INSTALLATION AND LIMITATIONS:

Installation shall be in strict accordance with HUD Minimum Property Standards, and local building codes for solid lumber construction.

TIMBERSTRAND LSL shall be stored and handled in accordance with established recommendations for plywood.

CERTIFICATION AND IDENTIFICATION:*

Trus Joist MacMillan shall certify that the TIMBERSTRAND LSL conforms to the requirements of this MR. PFS Corporation shall validate the manufacturer's certification that the TIMBERSTRAND meets the requirements of the MR. The quality control test records shall be made available for inspection by HUD upon request.

Each member certified as conforming to this MR shall be marked with the following information:

a. TIMBERSTRAND LSL

b. Manufacturer's name of logo.

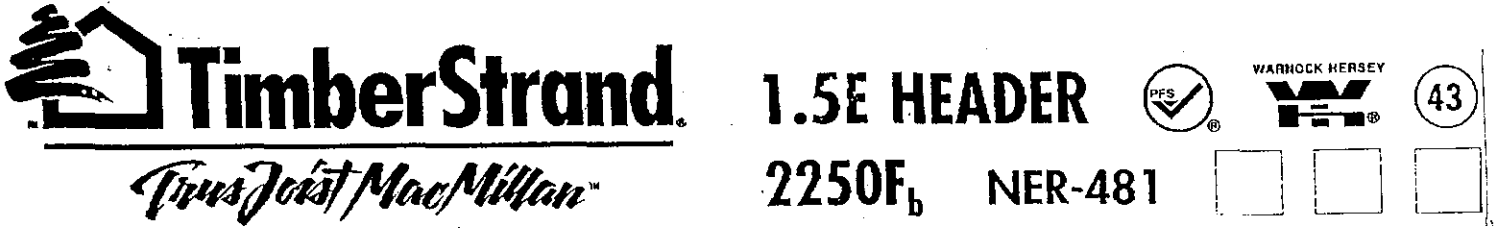
c. Registered logo of PFS.

d. HUD MR 1265.

e. Mill number.

*Sponsor: please furnish a sample stamp

SAMPLE STAMP



WARRANTY:

Trus Joist MacMillan warrants TIMBERSTRAND LSL to be free of any defects due to faulty materials and workmanship in the manufacturing process for a period of 20 years from the date of installation. The liability of Trus Joist MacMillan under this warranty shall be limited to replacement of defective materials and the cost of installation or at the option of Trus Joist MacMillan equal payment in lieu thereof.

This warranty applies to any materials failure due to manufacturing only and does not cover nor will the manufacturer be liable for any defects or damage due to misuse, improper installation, or damage resulting from fire, lightning or other causes beyond the manufacturer's control.

This manufacturer's warranty does not relieve the builder, in any way, of responsibility under the terms of the Builder's Warranty required by the National Housing Act or under any provisions applicable to any other housing program. A copy of the manufacturer's warranty shall be furnished by the builder to the homeowner.

MANUFACTURER'S RESPONSIBILITIES:

Issuance of this Materials Release (MR) commits the manufacturer to fulfill, as a minimum, the following:

1. Produce, label and certify the material, product or system in strict accordance with the terms of this MR.

2. Provide necessary corrective action in a timely manner for all cases of justified complaint, poor performance or failure reported by HUD.

3. When requested, provide the Office of Manufactured Housing and Regulatory Functions, Manufactured Housing and Construction Standards Division, HUD Headquarters, with a representative list of properties in which the material, product or system has been used, including complete addresses or descriptions of locations and dates of installation.

4. Inform HUD in advance of changes in production facilities, methods, design of the product, company name, ownership or mailing address.

EVALUATION:

This MR shall be valid for a period of three years from the date of initial issuance or most recent renewal or revision, whichever is later. The holder of this MR shall apply for renewal or revision 90 days prior to the Review Date printed on this MR. Submittals for renewal or revision shall be sent to HUD Headquarters. Appropriate User Fees shall be sent to:

U. S. Department of Housing and Urban Development
Technical Suitability of Products Fees
P. O. Box 954199
St. Louis, MO 63195-4199

The holder of this MR may apply for revision at any time prior to the Review Date. The revision may be in the form of a supplement to the MR.

If the Department determines that a proposed renewal or supplement constitutes a revision, the appropriate User Fee for a revision will need to be submitted in accordance with Code of Federal Regulations 24 CFR 200.934, "User Fee System for the Technical Suitability of Products Program," and current User Fee Schedule.

CANCELLATION:

Failure to apply for a renewal or revision shall constitute a basis for cancellation of the MR. HUD will notify the manufacturer or producer that the MR may be canceled when:

1. conditions under which the document was issued have changed so as to affect production of, or to compromise the integrity of the accepted material, product, or system,

2. the manufacturer has changed its organizational form without notifying HUD, or

3. the manufacturer has not complied with responsibilities it assumed as a condition of HUD's acceptance.

However, before cancellation, HUD will give the manufacturer a written notice of the specific reasons for cancellation, and the opportunity to present views on why the MR should not be canceled. No refund of fees will be made on a cancelled document.

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This Materials Release is issued solely for the captioned firm, and is not transferable to any person or successor entity.
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